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A report for Bernard Hastie & Company Limited by Claudine Gerrard B.Sc.



GGAT Projects



HMR 3 Showing various alterations to structures ©GGAT

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Summary

GGAT Projects has undertaken an assessment of the archaeological effects of a proposed development, at the Hasties site along Morfa Road in the Hafod, Swansea. The assessment reviewed information held by the regional Historic Environment Record and the National Monuments Record, as well as cartographic and documentary sources. Aerial photographs were examined and a site visit made. A rapid review of geotechnical data from exploratory holes was also made, which has identified potential archaeological deposits (Ground Investigation 2008).

A total of twenty-seven sites of archaeological interest were identified through the current study, including two Listed Building (Grade II) and two Scheduled Ancient Monuments. No Registered Parks or Gardens or Designated Landscapes are located within the study area.

The proposed development has been assessed as having a major effect on five archaeological interests, as minor in eight cases and as none for the remaining fourteen.

It has been recommended that a building recording survey be carried out on HMR3, the newly identified 19th century buildings, prior to the commencement of any development. Also, a building recording survey is recommended for HMR14 the existing buildings of the Hasties site.

It has been recommended that an archaeological evaluation be carried out, to a design approved by the archaeological advisors to the LPA, to assess and record the survival and condition of any of the newly identified and known sites of archaeological interest. This evaluation should be carried out to the standards laid down by the Institute of Field Archaeologists before any decision on the planning application is taken as the evaluation may provide information useful for identifying potential options for minimising or avoiding damage to the archaeological resource (Welsh Office Circular 60/96 section 13).

It has been recommended that a written scheme of investigation and plan for mitigation be produced based on the results of the evaluation in order to provide a clear outline for a programme of continuing archaeological works prior to any development commences.

It has also been recommended that any further geo-technical works or ground investigations within the development area be monitored on site by an archaeologist.

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1. Introduction

1.1 Planning history

The Glam organ-Gwent Archaeologi cal Trust, Projects Division (**GGAT Projects)** was commissioned by PMG Estates Lim ited to undertake a desk-based assessm ent in order to determine the effect of the development on the archaeological resource.

1.2 Specification and methodology for study

The assessment comprises a review of existing inform ation about the archaeological resource within a 0.25sq km study area. The study area is centred on NGR SS6618 9462 and is outlined in green in Figure 1. The assessment is intended to conform to the *Institute of Field Archaeologists' Standards and Guidance for Archaeological Desk-based Assessments*.

Information recorded on the regional Histor Monuments Record (NMR) was assessed. Ca studied, along with relevant published inform ation. Current Listed Building data and information on Scheduled Ancient Monum ents and registered landscapes was obtained from Cadw. Collections of aerial photographs held by the Central Register of Air Photography for Wales were examined and additional information requested from the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW).

A site visit was undertaken on the 3 October 2007 to assess the current condition of the known archaeological features and to check for previously unrecorded sites.

1.3 Assessment criteria

The archaeological sites within the study area available criteria that are nationally agreed; these are set out in the Departm ent of Transport/Welsh Office/Scottish Office Design Wanual for Roads and Bridges paragraph 3.4 Vol. 11 Section 3 Part 2 (Cultural Heritage).

- Category A: national importance
- Category B: regional importance
- Category C: local importance
- Category D: low importance

To these an additional category has been added

• Category U: unknown

The assessment of the importance of individual sites is essentially a subjective exercise based upon the experience of the project team. The importance of certain sites will be implied by their status within the statutory fram ework. Scheduled Ancient Monuments will always be of national importance; Listed Buildings will be of at least regional importance. Values assigned to other sites are given both in relation to their individual importance and to their context within the wider landscape.

The condition of individual sites and the general overall condition of surviving rem ains has bearing on the value of the sites them selves and on the value that they im part within a wider landscape context. The condition of sites is recorded following the system used by the GGAT SMR, using the following criteria:

• Intact: the site is intact

- Near intact: the site is nearly intact
- Damaged: the site has been moderately damaged
- Near destroyed: the site has nearly been destroyed
- Destroyed: the site has been destroyed
- Restored: the site has been restored
- Moved: the site has been moved (usually finds)
- Not known: the condition of the site is not known

For the purposes of desk-based assessments, rarity is assessed at regional level only. The following criteria are used:

- High: very few sites of this type are known
- Medium: the site is not unusual, but cannot be considered common
- Low: the site is quite common

Group association is where a connection be demonstrated. These will usually be of the same period, but m ay include groups where the presence of an earlier site or sites has led to the form ation of a later complex, or where an earlier site or sites can be shown to have acquired importance as part of a later complex. The criteria are as follows:

- High: the site form s part of an interconn ected complex occupying a clearly definable landscape where little or no fragmentation has occurred
- Medium: the site is part of an interconnected complex, which is either limited in scope or badly fragmented
- Low: there are few or no other sites, which are associated

Historical association is where there is a link between the site and known historical or cultural persons or events. Prehistoric sites, which are by definition before historical evidence, cannot have any contemporary historical association, but they may acquire later associations. For the Roman and Early Medieval periods, where survive all of historical evidence is poor and patchy, any contemporary documentation at all will be important. Two classifications are given for historical association, one reflecting the certainty of the identification, and the other its importance. Only sites with certain or possible association can be assessed for importance, and historical association can only increase the importance of a site; the absence of it will never decrease its importance.

Historical association- identification

- Certain
- Possible
- Unknown

Historical association- importance

- High
- Medium
- Low

The assignment of values to identif ied interests requires consideration of the reliability and accuracy of the source data, ranging from fully-recorded features seen in open excavation to antiquarian comments on finds of note from a poorly-defined location. The confidence with which the values have been assigned is noted, using the following criteria:

- High: existing information is reliable and detailed
- Medium: existing information is apparently reliable but limited in detail
- Low: existing information is too limited to allow its reliability to be assessed

The effect of the proposal on the archaeological resource has been assessed using the following criteria:

- Severe: total loss
- Major: significant loss, likely to result in a reduction of value of the surviving site
- Minor: loss unlikely to result in a reduction of value of the surviving site
- None: no identifiable effect
- Beneficial: development will protect, preserve or enhance the site better than if the development did not occur

2. Background

2.1 Location and Topography

The study area is centred on NGR SS6618 9462 in the Hafod on an area of high ground above and to the west of the River Tawe and is bounded to the east by Neath Road and the railway branch line into Swansea. A num ber of working industrial buildings owned and leased by the Hastie group currently occupy the area.

2.2 Geology

Swansea is situated on Carboniferous Coal m easures; the extraction of coal from this area has greatly influenced the history and developm ent of the region. The soils over the study area are largely un-surveyed but will likely include all uvium associated with the River Tawe (SSEW 1983).

2.3 Walkover survey

A walkover survey was conducted on the 3 October 2007. The area was photographed, all sites previously identified from a search of the local sites and monuments record and national monuments record were visited in order to a ssess their current condition. Fourteen previously unrecorded sites were investigated. It was also not ed that the northern half of the site had been landscaped flat where there had previously been a small hill (Plate 1). A sample of photographs taken illustrating the current condition of certain archaeological interests and the site in general can be seen on Plates 1-6 (Appendix II).

2.4 Historical & Archaeological background

2.4.1 Prehistoric (up to AD43) and Roman (AD43 to 410)

Evidence for activity through the Prehistoric and Roman periods in this region is lim ited to a few isolated find spots within the bounds of modern Swansea, including a sherd of Rom an cooking pot (PRN 00424w) from the alluvium at the edge of the North Dock and a group of Roman coins of the early 4th century found in Castle Street (PRN 00423w). These finds indicate that there was some activity in the vicinity during these periods, though as yet no settlement evidence has been found. It has been suggested that a Rom an crossing must have existed at some point along the length of the Ri ver Tawe, however it is believed more likely to be further north and not within the current development area (Maylan pers comm.) despite a reference to work undertaken by Colonel W, LI, Morgan placing the crossing point with the current study area in the Royal Commission of Ancient and Historical monuments in Wales' inventory for Glamorgan (RCHAMW 1976; 108)

2.4.2 Early Medieval (410 to 1066)

It is thought that Swansea originated as a S candinavian trading port in the 9 th and 10 th centuries; the place name of 'Swansea' is believe d to derive from the Scandinavian personal name 'Sveinn', and 'ey' meaning an island or inlet (Williams 1990). This place name evidence may suggest trading activity focused around the natural harbour at the mouth of the River Tawe with associated settlement being established nearby (Howell 2000). However there is a lack of any conclusive physical evidence to support this assertion.

2.4.3 Medieval (1066 to 1485)

The first definite record of Swansea appears in the twelfth century in a charter granted by William Earl of Warwick when the original motte-and-bailey earth and timber castle was founded as the *caput* or administrative centre for the Norm an lordship of Gower. This castle was rebuilt in stone probably during the thirt eenth century at its largest occupying land extending from College Street/W elcome Lane in the north to Caer Street/Castle Lane at the south, and from Princess W ay in the west to the Strand in the east (Evans 1983). A town quickly grew up around the castle that is also recorded in the charter and like the castle was subject to frequent attacks by the Welsh in 11th and 12th centuries. The town is known to have eventually been defended by a wall and ditch; a number of excavations around Wind Street and the High Street have uncovered parts of this medieval defence. Swansea flourished and grew during the earlier m edieval period a suburb called 'Bovetown' was established along High edieval town walls (Calendar of Close Rolls 1429-35) Street to the north outside of the m though this area is unlikely to have extended as far north as the current study area. There is little evidence for activity or occupation outside of the town 'centre' at this point. A series of plagues through the 13th and 14th centuries and attacks during the Glyndwr rebellion brought about a period of decline in Swansea; m anifesting as a reduced population resulted in slowed trade and production within the town at this time.

2.4.4 Post-medieval (1485 to present)

Ideally situated to take advantage of the 17th century expansions in coal trade Swansea was located close to a ready supply of coal and was situated on a tidal river that provided an ideal communication route for trade. The establishment of metal industry and the construction of numerous smelting works along the Tawe, including the Hafod Copper Works, located partially within the study area, founded by John Vi vian, were a product of this trade. By the beginning of the 18th century the River Tawe had become a vital conduit for the transport of raw materials for the coal and metal industries, along with the construction of the Swansea canal in 1794-96 this area of the lower Swan sea valley was rapidly becoming a centre for large-scale industry. Continuing large-scale coal and metal trade and production supported an increased population in Swansea from 1,792 inhabitants in 1707 to 10,117 in 1801 this figure increasing again to 94,537 by 1901 (Tawe Heritage Waterfront 2007).

2.5 The Study area

Until the industrial period there is little eviden ce for intensive developm ent within the study area an anonym ous poem of 1737 (later reprinted in an issue of *The Cambrian* from 1865) describing the area as 'Delightful Hafod, most serene abode!'. The poem was written at a time when the Hafod was in use as a popular walking and beauty spot (Davies 1996).

Documentary evidence and historic mapping with coverage of the area show changes that have taken place in land use within the present study area. A plan of 1771 (Figure 2) showing the River Tawe from its mouth right the way up to the village of Landore depicts the study area as low marshland known as Hafod Marsh. Another later map of 1836 (Figure 3), drawn up as part of a bid to construct the New Cut Canal, records the area in question as a Copper Ore Yard and area of land belonging to Hafod Farm (seen labelled as '100' in the Figure 3). It is interesting to note at this point the generally accepted m eaning of the W elsh term *Hafod*; a seasonal settlement occupied during the sum mer and related to the movement of livestock, generally located on high ground. Hafod is applied specifically to the phenom enon of transhum ance in Wales, a practice common during the early medieval period with these sites becom permanently occupied through the later m edieval period. Despite an area of land within the wider study area being recorded in historic mapping as belonging to Hafod Farm , it is felt unlikely that this area will yield evidence for the medieval transhumance, as it does not fit with the overall topographic pattern of *Hafod* being located on high ground. Hafod Farm which is felt more likely to be the location of any possible medieval activity, is located som e 300 m etres to the south of the study area. Thus indicating that prior to the arrival of the Vivians' various factories; including the Hafod Copperworks, Phosphate W orks and Iron Works the area had been relatively untouched by industrial development.

Investigation of the 1847 St John-Juxta-Swan sea tithe m ap and apportionm ent has provided details of land ownership and land use within the study area. The area in question is detailed in the tithe apportionm ent as owned by the Earl of Jersey and leased out to various people including, most notably, one J.H.Vivian, uses are listed as Hafod Copperworks and Ash Bank, other plots of land on the tithe within the area are still listed as pasture at this point.

Swansea Canal (01046.0w/34494) constructed in 1794-96 crossed on the west side of the development area where it linked to Pottery Lock (01782w), likely to have been utilised by the

phosphate works for transportation to and from the site. Neither of these interests were visible during the site visit as they are long since fille d in. A steady increase to the num ber of railway lines (HMR15) serving the area is evident in the historic mapping available, a reflection of the growth in industry (Plate 2).

It is interesting to note a large 'T' shaped building just to the south of the development area on an Ordnance Survey (OS) map dating to 1830-31, the building was not previously seen in the 1771 plan mentioned above and is gone again by the later 1836 map. This gives us some indication as to the fast pace of change and expansion in industry in the area through the late 18th and early 19th centuries.

Following a site visit, it was noted that a num ber of early industrial buildings or elem ents thereof are currently in use as working buildings on the Hasties site (HMR3, Plate 3-6). As a result of this observation a more detailed study of historic mapping available was carried out and a further visit to the local Record Office was made.

Of particular interest was the central structure of three adjoining buildings. It was seen to be of stone construction dissim ilar to the two adjoin ing structures, which were of brick, possibly indicating an earlier date for its construction (P late 5). Interestingly, though both this central structure and the structure adjoining to the s outh had wooden roofing internally, this was not visible from the outside due to the addition of later m etal sheeting. The third structure adjoining to the north originally had similar wooden roofing, though this has now been entirely replaced (pers comm. Hasties).

The central stone structure appears to be the iron foundry of the Hafod Phosphate works seen on the 1st edition Ordnance Survey m ap of 1879. The basic ground plan of this structure remains little changed through m aps dating to 1899 (2nd edition OS m ap), 1905 (Swansea Index map), and 1919 (3rd edition OS map). The structure as it currently exists can be seen in a photograph taken in the early sixties, included in a publication relating to the history of the Hasties site (Boorman 1987).

The existing Hasties site (HMR14) itself is all so considered to be of significant local archaeological and historical interest as it has formed part of Swansea's industrial history for almost fifty years.

3. Archaeological Interests

There are 27 sites of archaeological interest id entified within the study area (Tables 1 & 2; Figure 1). These include two listed buildings (Grade II), and two Scheduled Ancient Monuments. No Registered Parks and Gardens or Designated Landscapes are present. Fifteen previously unidentified sites were identified by the current study. Further inform ation relating to these interests can be found in the gazetteer in Appendix IV.

Numbers with a letter suffix are Prim ary Record Numbers (PRNs) in the regional Historic Environment Record (HER). Five and six figur e numbers without a letter suffix are National Primary Record Numbers (NPRN's) of the National Monuments Record, as supplied to the SMR under the ENDEX agreement. Numbers with a 'LB' prefix are Listed Buildings, as provided by Cadw. Sites represented by HMR followed by a two-digit number correspond to new or potential sites identified by the current study. Value has been ascribed to each archaeological interest based on the criteria set out in section 1.3.

Table 1: Previously known archaeological interests

ID	NGR	Name	Period	Site status	Value
00829w/85092/G M481	SS66339472	WHITE ROCK COPPER WORKS	POST- MEDIEVAL	SAM	А
01073w/850931/ GM481	SS66339454	WHITE ROCK WORKS CANAL TUNNEL	POST- MEDIEVAL	SAM	А
300023/LB82483 /04636w	SS66109440	WHITE ROCK DOCK	POST- MEDIEVAL	LBII	А
300188/LB16880	SS66149474	LOCOMOTIVE SHED (HAFOD COPPER WORKS)	POST- MEDIEVAL	LBII	В
01046.0w/34494	SS66109450	SWANSEA CANAL	POST- MEDIEVAL	NONE	В
02014w	SS66109443	HAFOD FORGE	POST- MEDIEVAL	NONE	В
03539w/13552	SS65979461	HAFOD METHODIST CHAPEL	POST- MEDIEVAL	NONE	В
85094	SS66349478	KILN (WHITE ROCK COPPER WORKS)	POST- MEDIEVAL	NONE	В
01046.10w/3448 5	SS66129443	CANAL BRIDGE	POST- MEDIEVAL	NONE	С
01782w	SS66119445	POTTERY LOCK	POST- MEDIEVAL	NONE	С
85428	SS65959478	No.98 NEATH ROAD	POST- MEDIEVAL	NONE	С
85431	SS65969477	No.94 NEATH ROAD	POST- MEDIEVAL	NONE	С

Table 2: New or potential sites identified by the current study

ID	NGR	Name	Period	Site status	Value
HMR1	SS66199457	HAFOD PHOSPHATE WORKS	POST- MEDIEVAL	NONE	В

			POST-		
HMR2	SS66279451	WHITE ROCK FERRY	MEDIEVAL	NONE	С
HMR3	SS66199452	HAFOD FOUNDRY	POST- MEDIEVAL	NONE	С
HMR4	SS66149450	TRAMWAY	POST- MEDIEVAL	NONE	С
HMR5	SS66169474	DOCK	POST- MEDIEVAL	NONE	С
HMR6	SS66269456	QUAY	POST- MEDIEVAL	NONE	С
HMR7	SS66189482	FERRY	POST- MEDIEVAL	NONE	C
HMR8	SS66159483	GASOMETER	POST- MEDIEVAL	NONE	С
HMR9	SS66139463	TOWING PATH	POST- MEDIEVAL	NONE	С
HMR10	SS66259456	BUILDING FOOTINGS	POST- MEDIEVAL	NONE	D
HMR11	SS66199440	PETROL PUMPING STATION	POST- MEDIEVAL	NONE	D
HMR12	SS66189464	CONCRETE FOOTINGS	POST- MEDIEVAL	NONE	D
HMR13	SS66119448	ROMAN ROAD RIVER CROSSING	ROMAN	NONE	D
HMR14	SS66199457	HASTIES SITE	MODERN	NONE	D
HMR15	SS66139463	RAILWAY SIDINGS	MODERN	NONE	D

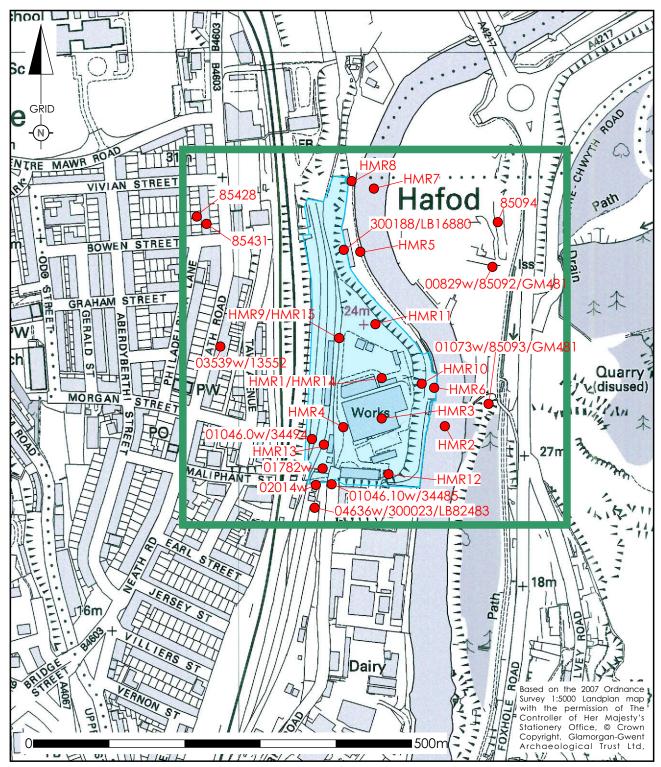


Figure 1. Location plan showing study area (green), development area (blue) and sites of archaeological interest (red)

4. Assessment

The effect of the development has been assessed based on the assumption that the construction works will be such that all archaeological depos its will be destroyed within the development area and applying the criteria set out in section 1.3. The effect has been assessed as major in five cases 01046.0w/34494 (Swansea Canal), HMR1 (Hafod Phosphate Works), HMR3 (Hafod Foundry), HMR14 (Hasties site), and HMR 15 (Railway sidings). Minor in eight cases, and as none in the remaining fifteen.

4.1 Effect on known sites

Table 3: Effect of development on known sites

ID	NGR	Name	Period	Value	Effect
01046.0w/344 94	SS66109450	SWANSEA CANAL POST-MEDIEVAL		В	MAJOR
300188/LB168 80	SS66149474	LOCOMOTIVE SHED (HAFOD COPPER WORKS)	POST- MEDIEVAL	В	MINOR
00829w/8509 2/GM481	SS66339472	WHITE ROCK COPPER WORKS	POST- MEDIEVAL	А	NONE
01073w/8509 31/GM481	SS66339454	WHITE ROCK WORKS CANAL TUNNEL	POST- MEDIEVAL	А	NONE
300023/LB824 83/04636w	SS66109440	WHITE ROCK DOCK	POST- MEDIEVAL	А	NONE
02014w	SS66109443	HAFOD FORGE	POST- MEDIEVAL	В	NONE
03539w/1355 2	SS65979461	HAFOD METHODIST CHAPEL	POST- MEDIEVAL	В	NONE
85094	SS66349478	KILN (WHITE ROCK COPPER WORKS)	POST- MEDIEVAL	В	NONE
01046.10w/34 485	SS66129443	CANAL BRIDGE	POST- MEDIEVAL	С	NONE
01782w	SS66119445	POTTERY LOCK	POST- MEDIEVAL	С	NONE
85428	SS65959478	78 No.98 NEATH ROAD POST MEDIEV		С	NONE
85431	SS65969477	No.94 NEATH ROAD	POST- MEDIEVAL	С	NONE

4.2 Effect of development on newly identified and potential sites

Table 4: Effect of development on new or potential sites

ID	NGR	Name	Period	Value	Effect
HMR1	SS66199457	HAFOD PHOSPHATE WORKS	POST- MEDIEVAL	В	MAJOR
HMR3	SS66199452	HAFOD FOUNDRY	POST- MEDIEVAL	С	MAJOR

HMR14	SS66199457	HASTIES SITE	MODERN	D	MAJOR
HMR15	SS66139463	RAILWAY SIDINGS	MODERN	D	MAJOR
HMR4	SS66149450	TRAMWAY	POST- MEDIEVAL	С	MINOR
HMR6	SS66269456	QUAY	POST- MEDIEVAL	С	MINOR
HMR8	SS66159483	GASOMETER	POST- MEDIEVAL	С	MINOR
HMR9	SS66139463	TOWING PATH	POST- MEDIEVAL	С	MINOR
HMR10	SS66259456	BUILDING FOOTINGS	POST- MEDIEVAL	D	MINOR
HMR11	SS66199440	PETROL PUMPING STATION	POST- MEDIEVAL	D	MINOR
HMR12	SS66189464	CONCRETE FOOTINGS	POST- MEDIEVAL	D	MINOR
HMR2	SS66279451	WHITE ROCK FERRY	POST- MEDIEVAL	С	NONE
HMR5	SS66169474	DOCK	POST- MEDIEVAL	С	NONE
HMR7	SS66189482	FERRY	POST- MEDIEVAL	С	NONE
HMR13	SS66119448	ROMAN ROAD RIVER CROSSING	ROMAN	D	NONE

5. Mitigation

At present no specific developm ent proposal as part of a planning application exists for the development area and as such it is possible only to provide generalised mitigation as part of this assessment.

There has been significant building activity in the development area over time, including most recently changes to the site since it becam e part of the Hasties Com pany in 1958. Following the site visit, it has been noted that a num ber of early industrial buildings or elements of such buildings survive and are in use as working buildings. The level of preservation for these noted archaeological interests is as yet not wholly clear, however, a rapid review of geotechnical data (Ground Investigation 2008) has shown that out of 28 exploratory holes only four were recorded as not containing som e form of br ick. The four negative exploratory holes were described as made ground, which is generally an indicator of buried archaeological deposits. One of these four (BH6) is an exception as it en countered an object too hard to break though at 1m depth suggesting the presence of significan t buried features blocking the route of the borehole. The remaining 24 exploratory holes contained some form of brick; of these WS1 and WS3 had their routes blocked (W S1 at 1.5m, WS3 at 0.20m and 3.0m) but these obstructions were broken though. Substantial brick walls were encountered in TP3 (from 0.20m to 2.5m in depth), TP5 (at 2.5m in depth) and TP6 (at 3.0m in depth) indicating the presence of surviving below ground structures.

5.1 Building Recording

It is recom mended that a building recording survey be carried out to assess and record the remains of the newly identified nineteenth century industrial buildings (HMR3). In the case of the Hasties site (HMR14), a building recording survey is also recommended.

5.2 Evaluation

Information concerning the rem aining arch aeological resource, including HMR1 and 01046.0w/34494, is limited, as at present the level of survival of these interests is not known. However, based on the geotechnical inform ation received it is likely that significant archaeological deposits survive below ground acro ss the site. Therefore, it may prove prudent to deal with this potential archaeological resource prior to the development commencing and as such it is recommended that an archaeological evaluation be carried out, to a design approved by the archaeological advisors to the LPA, to assess and record the survival and condition of any of the newly identified and known sites of archaeological interest. This evaluation should be carried out to the standards laid down by the *Institute of Field Archaeologists* before any decision on the planning application is taken as the evaluation may provide information useful for identifying potential options for maining or avoiding damage to the archaeological resource (Welsh Office Circular 60/96 section 13).

5.3 Scheme of investigation and watching brief

It is recommended that a written scheme of investigation and plan for mitigation be produced based on the results of the evaluation in order to provide a clear outline f or a program me of continuing archaeological works prior to any development commences. Further information concerning the archaeological resource could be uncovered during any ground investigations and additional geo-technical works and as such it is recommended that any works of this nature within the development area be monitored on site by an archaeologist as part of a watching brief.

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Appendix I Map Regression

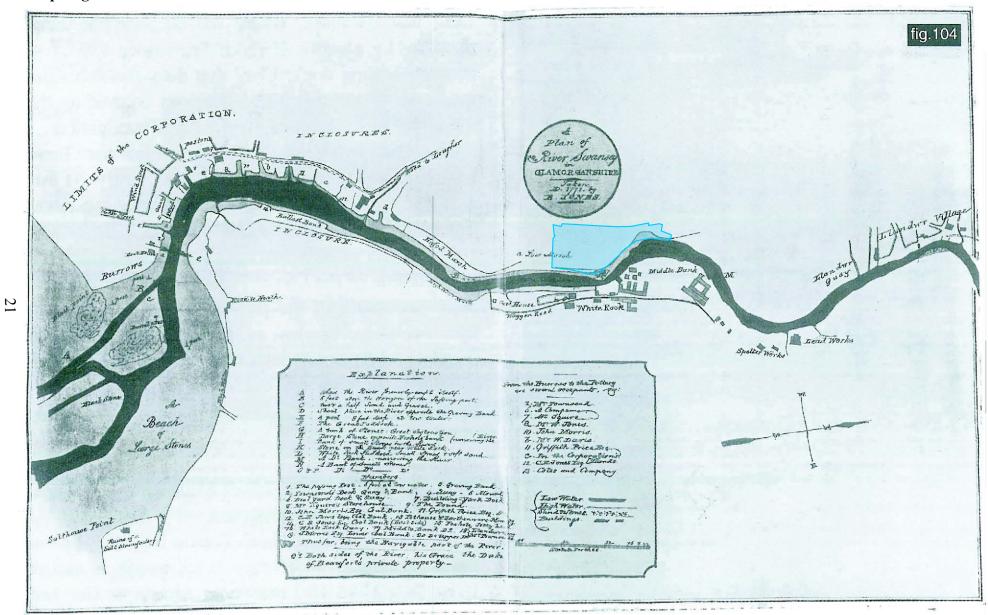


Figure 2. Extract from Copperopolis Plan of 1771 showing the Hafod area (development area shown in blue)

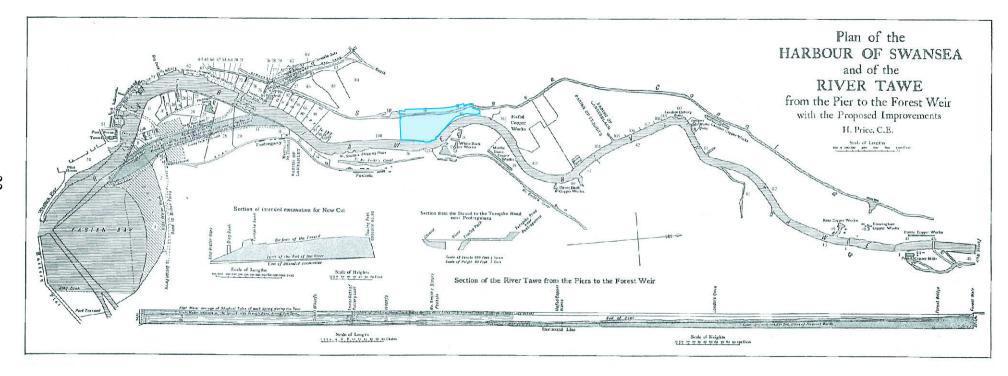


Figure 3. Extract from *Copperopolis* Plan of 1836 showing the Hafod area (development area shown in blue)

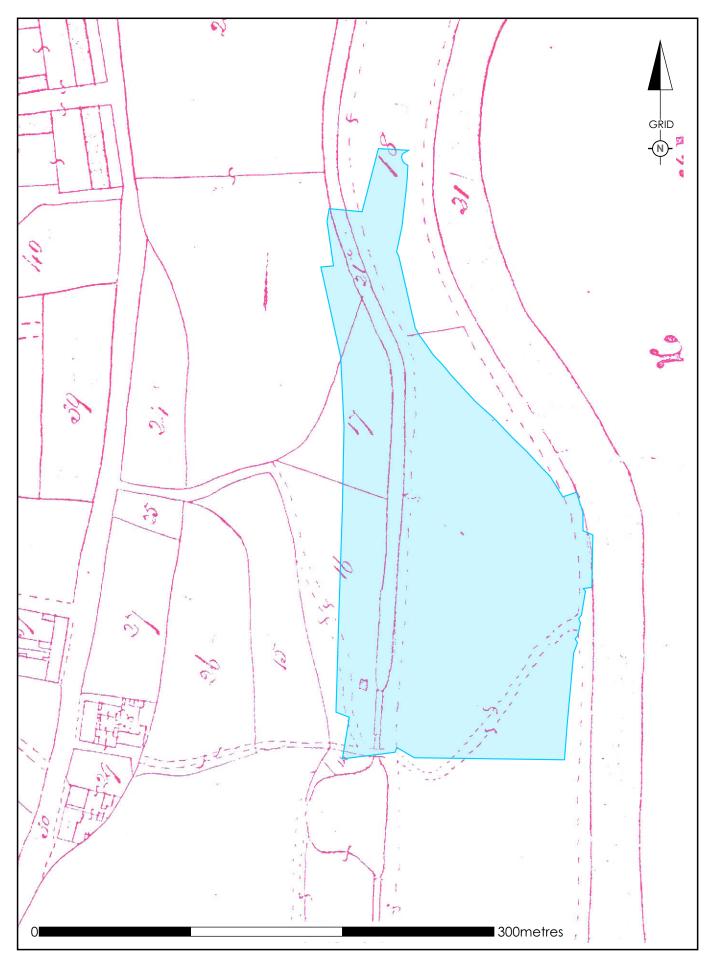


Figure 4. 1847 Tithe map with development area shown (blue)

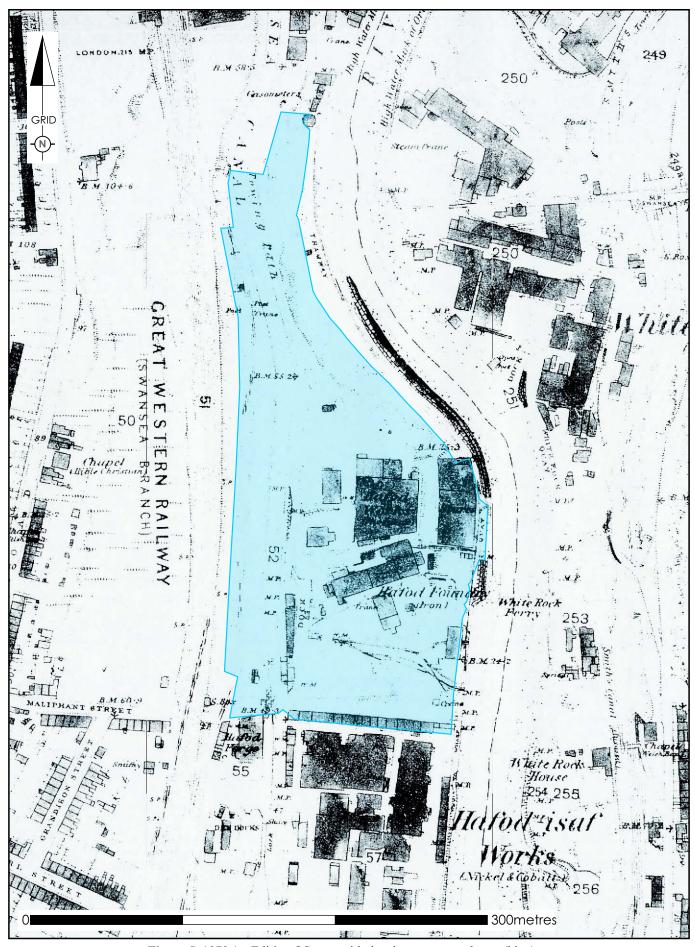


Figure 5. 1879 1st Edition OS map with development area shown (blue)

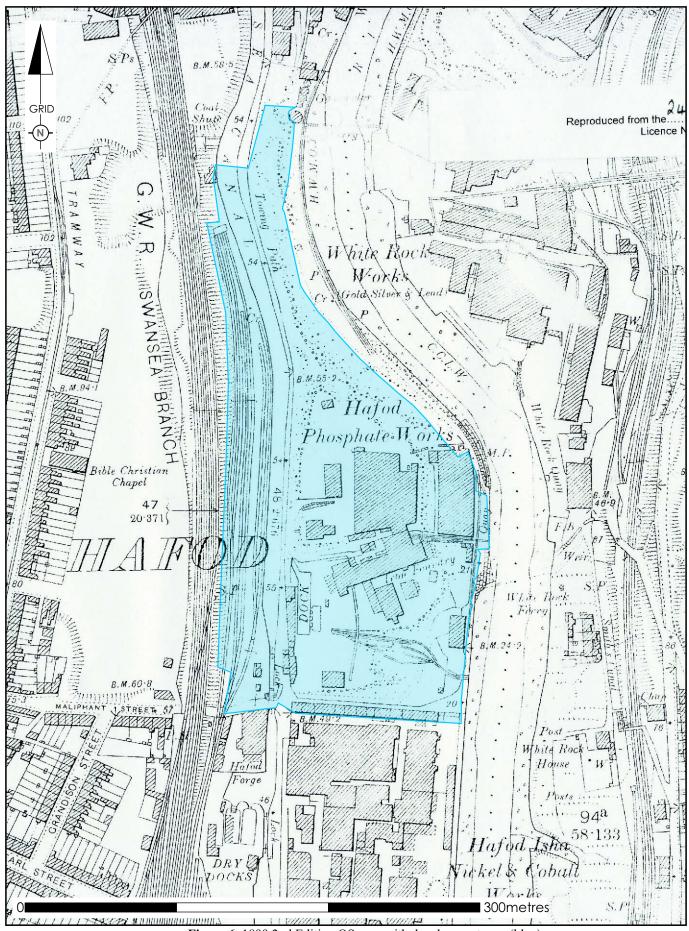


Figure 6. 1899 2nd Edition OS map with development area (blue)

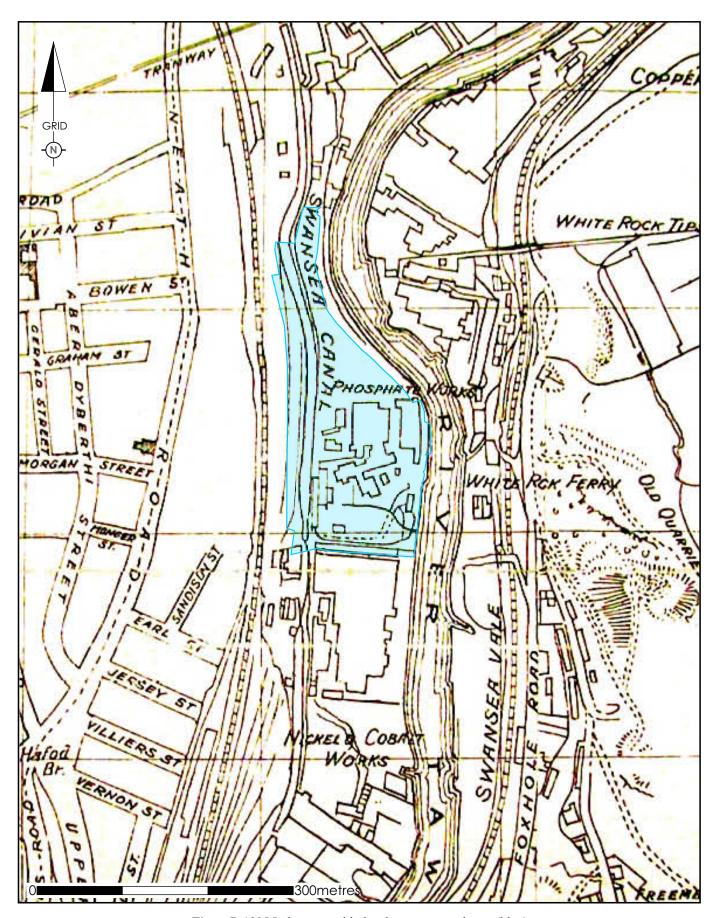


Figure 7. 1905 Index map with development area shown (blue)

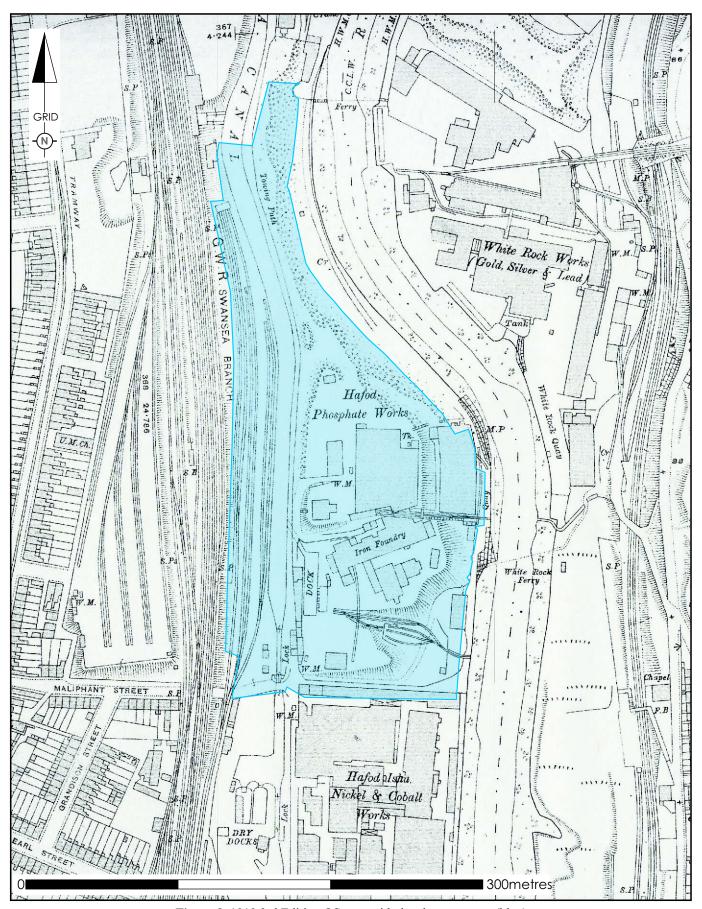


Figure 8. 1919 3rd Edition OS map with development area (blue)

Appendix II Walkover Survey

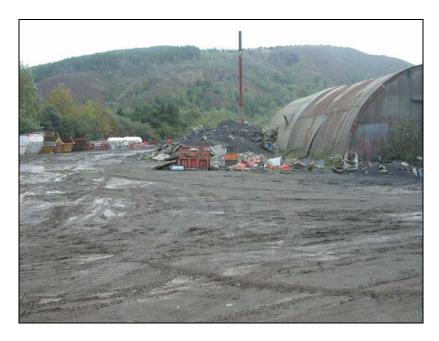


Plate 1. View from north of site to south east



Plate 2. View of railway sidings HMR15, west of site to south



Plate 3. View of the front of HMR3, looking south east



Plate 4. View of the side of HMR3, looking north east



Plate 5. View of HMR3 showing differing construction of stone (central structure) and brick (structure adjoining to south)

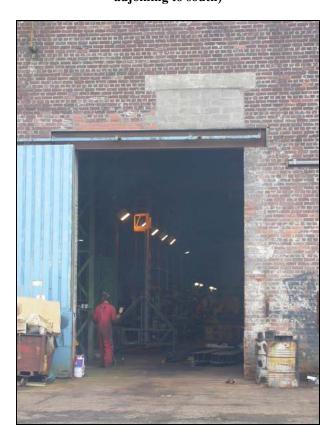


Plate 6. View of HMR3 showing various alterations to structures

Appendix III

Aerial Photographs with Coverage of the Evaluation Area

The following is a list of the aerial photographs w ith coverage of the evaluation area held by the Central Registry of Air Photography for Wales.

RAF Sorties

Sortie	Scale	Date	Frames
106G UK 1275	1:4800 23/03/1946		5226-27
106G UK 1419	1:9900 15/04/1946		4183-84
106G UK 1625	Various	07/07/1946	3271-72, 5287-88
CPE UK 2107 1:480	00 28/05/1947		5085-86
58 RAF 3506 1:199	999 21/04	/1960	F21: 70-71
1 PRU RAF 1179	1:25000	06/05/1987	15
1 PRU RAF 2301	1:35000	10/09/1991	27-28

Ordnance Survey

Sortie	Scale	Date	Frames	
OS 78 085	1:23000	11/06/1978	127-28	
OS 91 051	1:5200	16/04/1991	2, 3	
OS 92 039	1:5500	04/04/1992	166	
OS 94 360	1:8300	15/10/1994	167-68	

Commercial and other Sorties

Sortie	Scale	Date	Fran	ies
Meridian 54/68 211-13	8 Various	27/07/1968	54/68	3: 20-22, 43-45; 55/68:
Meridian 75/70	1:10000	23/09/1970	75/70:	166-67
Meridian 6/81	1:10000	16/04/1981	6/81:115-16	
Geonex	1:5000	01/05/1992	6692:	279-80

The above aerial photographs were exam ined and charted the growth of the industrial works, from an initial pair of buildings to the eight currently standing. A row of five structures (HMR10) was also visible on sorties 106G UK 1275, 106G UK 1625, 106G UK 1419 and CPE UK 2107, their dem olition had occurred by Meridi an 54/68 (1968), with their foundations apparent up to sortie OS 94 360 (1994).

Appendix IV

Gazetteer of archaeological interests

ID NAME

00829w/85092/GM481 White Rock Coppper Works

NGR PERIOD SS66339472 Post-medieval

SUMMARY

The White Rock Copper Works, was established in 1736. A var iety of important features survive above gr ound and the ar chaeological potential below-ground is very high. A furn ace survives near the north end of the site, underneath the later slag incline of the eastern tips. White Rock is the thir d oldest of the Swansea copper works, which was established by a partnership from Bristol at a time when c opper smelting was switching from blast-furnace to reverbatory furnace technology. The works we re closed in 1924 and the site was alm completely cleared in the 1960s. A cut- and-cover canal tunnel of 1783-85 remains on the site with the r emnants of the m uch-altered 'Great Workhouse' of 1736 on its wester n side, featuring pennant r ubble-sandstone with brick dressings. Also on the site is a re-excavated 17th century river dock, flanked on the north by a series of rubble-sandstone quay s built in the 19th century. A stone arch in the middle of the site both carried flues to a discharge chimney and supported an inclined railway carrying vast quantities of waste onto Kilvey Hill.

CONDITION **TYPE** SITE STATUS

Copper works Damaged SAM

CONFIDENCE EFFECT VALUE

High

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Certain (high) High High

ID NAME

01046.0w/34494 Swansea Canal

NGR PERIOD SS661945 Post-medieval

SUMMARY

The Swansea Canal was designed by Charles Roberts and Thomas Sheasby and was built between 1794 and 1798. Like all canals, it provided the reliable water transport essential for industrial development before the construction of the r ailway system, and at its pea k was carrying 400,000 tons of cargo a year. It was unique in Britain, however, in also supplying water power for many of the new enterprises along its route. Until the canal was closed to navigation in 1931, it provided power for at least 42 installations along its sixteen miles, and reputedly for the first electric house lighting in the valley, at Clydach. This unique dual role emphasises the desirability of preserving the canal together with the associated industrial installations wherever possible.

TYPE CONDITION SITE STATUS

Canal Near destroyed None

CONFIDENCE EFFECT VALUE None

GROUP ASSOCIATION

HISTORICAL ASSOCIATION RARITY Certain (high) High Low

 ID
 NAME

 01046.10w/34485
 Canal bridge

NGR PERIOD SS66129443 Post-medieval

SUMMARY

A post-medieval canal bridge with a fabric of coursed rubble sandstone, carries a stream over the canal. The bridge has a span of 6.4m, a deck of 3.7m, and arch-rings 3.5m thick.

TYPE CONDITION SITE STATUS

Canal bridge Damaged None

CONFIDENCE EFFECT VALUE

High None

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY

Unknown High Low

ID NAME 01782w Pottery Lock

NGR PERIOD SS66119445 Post-medieval

SUMMARY

A post-medieval lock on the Swansea Canal. It is situated opposite the two pottery industries which were formerly located between the Swansea Canal and the River Tawe.

TYPE CONDITION SITE STATUS

Lock Not known None

CONFIDENCE EFFECT VALUE

Medium None C

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown High Low

ID NAME

01073w/85093/GM481 White Rock Works Canal Tunnel

NGR PERIOD SS66339454 Post-medieval

SUMMARY

A post-medieval 'cut and cover' tunnel w ith underground wharves to provi de direct access for coal s upplies. It was constructed in 1783-85 to carry Smith's Canal through White Rock Copperworks. Smith's Canal, from Foxhole to Llansamlet dates from 1790-1803, following the line of an old wagon-way and was designed to transport coal from the Llansamlet collieries to the shipping tips bordering the east side of the Tawe at Foxhole.

TYPE CONDITION SITE STATUS

Canal tunnel Not known SAM

CONFIDENCE EFFECT VALUE

High None A

HISTORICAL ASSOCIATION GROUP ASSOCIATION High Medium

ID NAME 02014w Hafod Forge

NGR PERIOD SS66109443 Post-medieval

SUMMARY

The possible remains of Hafod Forge uncovered during construction of a water tower. The Forge is depicted on the 1st edition OS map of 1879 and the 2nd edition OS map of 1899.

TYPE CONDITION SITE STATUS

Forge Near destroyed None

CONFIDENCE EFFECT VALUE

Low None B

HISTORICAL ASSOCIATION GROUP ASSOCIATION High High

ID NAME

03539w/13552 Hafod Methodist Chapel

NGR PERIOD SS65979461 Post-medieval

SUMMARY

A post-medieval chapel, set slightly back fr om the street in a sm all plot of land, which it fills almost completely. The exterior is Gothic in style, with rock-faced sandstone and brick dressings; slate double-pitche d roof with the gable facing the street. It has a cen doorway, flanked by tall narrow pointed windows. The side walls are rendered, and appear to have three pointed windows. tral pointed

TYPE CONDITION SITE STATUS

Chapel Not known None

EFFECT CONFIDENCE VALUE

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown Low

ID **NAME**

04636w/300023/LB8 White Rock Dock

2483

PERIOD NGR SS661944 Post-medieval

SUMMARY

A dry dock and quay walls on the River Tawe at former White Rock works. Their exact date is unclear although it would seem that there was a dock already here in 1737 when the copper wo rks were built, and the dock was used by Thomas 2nd Baron Mansel for shipping coal, connected by the 'Great Coal Road' to the collieries at Llansam let. They are depicted on the Swansea Harbour Plan of 1836, and were part of the stone quays and tidal basins, which by the early C19, almost continuously lined the 4.8km dredged and navigable length of the lower Afon Tawe. The stonework has been altered over the years and was renovated in late C20 when the ruins of the works were landscaped.

TYPE CONDITION SITE STATUS Dry dock Damaged LBII (SAM)

CONFIDENCE EFFECT VALUE High None

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY

Certain (low) High Low

ID NAME

300188/LB16880 Hafod Copperworks Locomotive Shed

NGR PERIOD SS66149474 Post-medieval

SUMMARY

A post-medieval brick-built engine shed, se t on a terrace by the river. It was constructed to house a standard gauge Garrett lo comotive and it forms a part of the Hafod Copper works complex, which also includes a 1860-62 engine shed, a 1910 engine house, a tramway viaduct and offices. The Hafod Copperworks was established in 1810 by John Vivian and continued to be owned by the Vivian family until 1924 when it amalgamated with the adjacent Morfa Copperwor ks. It was subsequently operated by Yorkshire Imperial Metals until it closed in 1 980. The Vivian locomotive shed was built c1910 for the first standard gauge Garrett locomotive in Britain. The locomotive was used to transfer materials around the whole Hafod works site. The shed was built to a high specification to store and maintain the locomotive, with a saw-tooth roof, despite its narrow form, to maximise north light and ventilation of steam, and was proudly titled in glazed brickwork. The interior is open for its full length and wide enough for one railway track. There are remains of timber dividers placed laterally in the roof gables to carry steam from the locomotives to the central parts of the roof for ventilating. A service pit runs the length of the building in the centre of the floor. White glazed bricks in seven panels pick out letters more than a metre high to refer to the function of the building as Vivian and Son engine shed: 'V & S Ltd No1 SHED'.

TYPE CONDITION SITE STATUS

Engine Shed Damaged LBII

CONFIDENCE EFFECT VALUE High Minor B

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY
Certain (high) High Medium

ID NAME

85094 Kiln (Copper Works)

NGR PERIOD SS66349478 Post-medieval

SUMMARY

A post-medieval kiln, part of the White Rock Copperworks.

TYPE CONDITION SITE STATUS

Kiln Damaged None

CONFIDENCE EFFECT VALUE

Low None B

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY

Certain (high) High High

ID NAME

No. 98 Neath Road

NGR PERIOD SS65959478 Post-medieval

SUMMARY

A post-medieval dwelling. A photographic survey consisting of two black and white prints was conducted in 1996, with the negatives held by the RCAHMW.

TYPE CONDITION SITE STATUS

Dwelling Near intact None

CONFIDENCE EFFECT VALUE

High None

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY

Unknown High Low

ID NAME

No. 94 Neath Road

NGR PERIOD SS65969477 Post-medieval

SUMMARY

A post-medieval dwelling. A photographic survey consisting of three black and white prints was conducted in 1996, with the negatives held by the RCAHMW.

TYPE CONDITION SITE STATUS

Dwelling Near intact None

CONFIDENCE EFFECT VALUE

High None C

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown High Low

ID NAME

HMR1 Hafod Phosphate Works

NGR PERIOD SS66199457 Post-medieval

SUMMARY

A post-medieval phosphate works depicted on the 1st edition OS map of 1879, the 2nd edition OS map of 1899 and 3rd edition OS map of 1919.

TYPE CONDITION SITE STATUS

Factory Near destroyed None

CONFIDENCE EFFECT VALUE

Low Major B

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY High

ID NAME

HMR2 White Rock Ferry

NGR PERIOD SS66279451 Post-medieval

SUMMARY

A post-medieval ferry depicted on the 1st edition OS map of 1879, the 2nd edition OS map of 1899 and 3rd edition OS map of 1919.

TYPE CONDITION SITE STATUS

Ferry Unknown None

CONFIDENCE EFFECT VALUE

ow Major

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown High Medium

ID NAME HMR3 Hafod Foundry

NGR PERIOD SS66199452 Post-medieval

SUMMARY

A post-medieval iron works depicted on the 1st edition OS map of 1879, the 2nd edition OS map of 1899 and 3rd edition OS map of 1919.

TYPE CONDITION SITE STATUS

Foundry Near destroyed None

CONFIDENCEEFFECTVALUELowMajorB

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY
Certain (high) High Medium

ID NAME HMR4 Dock

NGR PERIOD SS66149450 Post-medieval

SUMMARY

A post-medieval lock, located adjacent to the Swansea Canal. It is depicted on the 1st edition OS map of 1879, the 2nd edition OS map of 1899 and 3rd edition OS map of 1919.

TYPE CONDITION SITE STATUS

Dock Near destroyed None

CONFIDENCE EFFECT VALUE

Low None

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY
Unknown High Low

ID NAME HMR5 Tramway

NGR PERIOD SS66169474 Post-medieval

SUMMARY

A post-medieval tramway depicted on the 1st edition OS map of 1879, the 2nd edition OS map of 1899 and 3rd edition OS map of 1919. It was constructed to provide access to the Hafod Copperworks Locomotive Shed.

TYPE CONDITION SITE STATUS

Tramway Damaged None

CONFIDENCE EFFECT VALUE

ow None

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY

Unknown High Low

ID NAME HMR6 Quay

NGR PERIOD SS66269456 Post-medieval

SUMMARY

A post-medieval quay depicted on the 1st edition OS map of 1879, the 2nd edition OS map of 1899 and 3rd edition OS map of 1919.

TYPE CONDITION SITE STATUS

Quay Unknown None

CONFIDENCE EFFECT VALUE

Low Minor

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown High Low

ID NAME HMR7 Ferry

NGR PERIOD SS66189482 Post-medieval

SUMMARY

A post-medieval ferry depicted on the 2nd edition OS map of 1899 and 3rd edition OS map of 1919.

TYPE CONDITION SITE STATUS

Ferry Unknown None

CONFIDENCE EFFECT VALUE

Low None

HISTORICAL ASSOCIATION GROUP ASSOCIATION High Medium

ID NAME HMR8 Gasometer

NGR PERIOD SS66159483 Post-medieval

SUMMARY

A post-medieval gasometer depicted on the 1st edition OS map of 1879 and the 2nd edition OS map of 1899. A gasometer is a large container used for keeping natural gas at near atmospheric pressure and am bient temperature. Gasometers tend to be used for balancing purposes (i.e. making sure gas pipes can be operate within a safe range of pressures) rather than for actually storing gas for later use.

TYPE CONDITION SITE STATUS

Gas Holder Unknown None

CONFIDENCE EFFECT VALUE

Low Minor C

HISTORICAL ASSOCIATION GROUP ASSOCIATION High High

ID NAME HMR9 Towing Path

NGR PERIOD SS66139463 Post-medieval

SUMMARY

A post-medieval towing path depicted on the 1st edition OS map of 1879, the 2nd edition OS map of 1899 and 3rd edition OS map of 1919. The path is associated with the Swansea Canal.

TYPE CONDITION SITE STATUS

Tow Path Damaged None

CONFIDENCE EFFECT VALUE

Medium Minor

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown High Low

ID NAME

HMR10 Building Footings

NGR PERIOD SS66259456 Post-medieval

SUMMARY

A row of five structures was also visible on sorties 106G UK 1275, 106G UK 1625, 106G UK 1419 and CPE UK 2107, their demolition had occurred by Meridian 54/68 (1968), with their foundations apparent up to sortie OS 94360 (1994).

TYPE CONDITION SITE STATUS

Building footings Damaged None

CONFIDENCE EFFECT VALUE

Medium Minor D

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown High Low

ID NAME

HMR11 Petrol Pumping Station

NGR PERIOD SS66199440 Post-medieval

SUMMARY

The remains of a petrol pumping station that formerly served the Hasties site.

TYPE CONDITION SITE STATUS

Petrol Station Damaged None

CONFIDENCE EFFECT VALUE

Medium Minor D

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY

Unknown High Low

ID NAME

HMR12 Concrete Footings

NGR PERIOD SS66189464 Post-medieval

SUMMARY

Concrete footings seen on the site visit, extending down eastern edge of the Hasties site boundary.

TYPE CONDITION SITE STATUS

Building footings Damaged None

CONFIDENCE EFFECT VALUE

Medium Minor D

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown Medium Low

ID NAME

HMR13 Roman Road River Crossing

NGR PERIOD SS66119448 Roman

SUMMARY

A Roman crossing point over the River Tawe was identified by Col W.LI. Morgan during excavations of 'Pottery Lock'. The exact location of this lock is not clear but an inventory entry suggests it is within the study area, RCHAMW (1976, 108).

TYPE CONDITION SITE STATUS

Roman River Crossing Unknown None

CONFIDENCE EFFECT VALUE

Medium None D

HISTORICAL ASSOCIATION GROUP ASSOCIATION RARITY Unknown Low High

ID NAME HMR14 Hasties Site

NGR PERIOD SS66199457 Modern

SUMMARY

The site as it is today became part of the Hastie Group in 1958 and has been used for a variety of industrial purposes since, employing people from the local community the site has a reputation for its high quality of work and has been an important part of the regions industrial history for just under fifty years.

TYPE CONDITION SITE STATUS

Industrial Near intact None

CONFIDENCE EFFECT VALUE

High Major D

HISTORICAL ASSOCIATIONGROUP ASSOCIATIONRARITYCertian (low)HighMedium

ID NAME HMR15 Railway Sidings

NGR **PERIOD** SS66139463 Modern

Railway sidings off of the main Swansea GWR branch line, which appear disused. The Swansea GWR branch line is the single rail p rovider that remains from the ten that competed to serve and access the port and industries of Swansea during the eighteenth and nineteenth centuries.

SITE STATUS **TYPE** CONDITION

Railway siding Near intact None

CONFIDENCE **EFFECT** VALUE D

High Major

RARITY HISTORICAL ASSOCIATION GROUP ASSOCIATION

Certian (low) High Low